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Serial vs. Parallel War: An Airman's View of Operational Art

A Monograph
by

Major Robert R. Soucy, II
United States Air Force

School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

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This monograph discusses, from an airman's perspective, the expression of American operational art called parallel war. Parallel war is defined as the simultaneous and near continuous attack against strategic, operational, and tactical targets. The author explores whether or not parallel war has become the ideal expression of American operational art (i.e., is it the best way to achieve quick, decisive victory with minimum friendly casualties?).

Two campaigns are examined. MacArthur's serial campaign (sequential, step-by-step approach) against the Japanese in the South West Pacific is the first. It is contrasted with Schwarzkopf's parallel war against Iraq during Desert Storm. Consistent trends between the two styles are highlighted while the unique features of parallel war are discussed.

The monograph concludes that parallel war is significantly different from serial war. The maturation of American airpower gives commanders unprecedented ways and means to influence the course of events and the enemy decision makers. The United States now can, through parallel war, quickly shatter an enemy's strategic and operational ability to resist. Its employment depends on recognizing when it can be used -- a skill which comes from understanding both the situation and the tools available.

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Major Robert R. Soucy, II

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Approved by:

Ben L Elley

LTC Ben L. Elley, MA — Monograph Director

James R McDonough

COL James R. McDonough, MS — Director, School of Advanced Military Studies

Philip J. Brookes

Philip J. Brookes, Ph. D. — Director, Graduate Degree Program

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INTRODUCTION

> The nature of modern warfare demands that we fight as a team. This does not mean that all forces will be equally represented in each operation. Joint force commanders choose the capabilities they need from the air, land, sea, space, and special operations forces. . . ***Joint warfare is essential to victory.***
> Joint Pub 1[1]

Recent United States military doctrinal manuals have stressed that one of the keys to victory is a clear understanding of the critical linkage between strategic objectives and tactical battles known as the operational level of war.[2] The careful blending of the right force at the right time to do the right mission is a difficult task; there are no precise scientific rules to follow. Instead, the orchestration of efforts at the operational level requires a mix of experience, education, and creativity. When done successfully it is called art and its practitioners are called operational artists;[3] those who fail at this level are given whatever names the victors choose to include in their histories.

This paper examines one recent expression of operational art called parallel war. Parallel war (defined as simultaneous and near continuous attack against strategic, operational, and tactical targets) is a seemingly new form of war brought about in large measure by the maturation of American airpower.[4] To facilitate joint understanding, this paper will answer the following research question: Has parallel war become the ideal expression of American operational art? In this paper "ideal" is the best way to meet the American criteria for military success: quick, decisive victory with minimum friendly casualties.[5]

To determine the unique features, advantages, and disadvantages of parallel war, two campaigns will be compared and contrasted. The first, an example of serial war (attacking an enemy in a step-by-step, sequential

manner, normally with a tactical/operational focus) happened fifty years ago during World War II: General MacArthur's masterful use of maneuver against the Japanese in the Southwest Pacific area. Of particular interest will be General MacArthur's use of airpower in his operations at Buna, the Bismark Sea, and at Lae. American airmen derive much of their current understanding of operational art from this period.

The second campaign examined is the parallel war waged by the U.S. led coalition against Iraq during Desert Storm. General Schwarzkopf's joint orchestration of his available forces to defeat the Iraqis exhibited just how far the American military has come since World War II. But there are some remarkable similarities to World War II that still persist. Again, particular attention will be paid to the continuity of certain airpower concepts. A discussion of those and other conclusions follows the analysis of the two campaigns in the implications section.

Some cautions are in order at this point. First, this is an examination of parallel war from the air perspective of operational art. Various other viewpoints (Department of Defense, Army, Navy, German, Russian, etc.) are incorporated to help the reader evaluate the validity of the points being made; however, a certain bias exists. This bias is not an attempt to convert readers into air disciples; rather, it is an attempt to build trust by expanding the dialogue between air and surface forces. Although the important relationship between air and surface forces is dynamic and maturing, it is once again fraught with problems, misunderstandings, and intense debate.[6] Some authors contend the whole air-surface relationship rests on shaky ground and needs careful reexamining.[7] This paper will hopefully bear fruit in the Clausewitzian sense and generate one of the intuitive flashes of insight he so highly valued.[8]

This desire is not just space filling pablum; it is an important concern. Indeed, future U.S. victory will most likely depend, at least to some small degree, on open and frank discussions within the military designed to build joint cohesion. As Joint Pub 1 states:

> The requirement to plan and conduct joint operations demands expanded intellectual horizons and broadened professional knowledge. Leaders who aspire to joint command must not only have mastered the essentials of their own Service capabilities, but also must understand the fundamentals of combat power represented by the other Services. . . they must have a clear sense of how these capabilities are integrated for the conduct of joint and combined operations.[9]

There is an additional hope that this paper might help its readers recognize a danger noted by military history professor I. B. Holley of Duke University. Professor Holley contends doctrine can become a subtle trap when it solidifies into dogma because of a lack of appreciation of the potential technological advances have for changing the character of war.[10] Therefore this paper challenges certain conventional assumptions to provoke fresh thinking and avoid the disease known as "hardening of the categories," where mental flexibility and openness perish.[11] Considering the characteristics of parallel war should provide a broader perspective when planners at the operational level develop future campaign plans and courses of action.

Two final caveats are necessary. First, while this paper focuses on the conventional mechanized conflict typified by World War II and the Gulf War, there are clearly other types of war possible in the future. Some analysts see an increase in insurgencies; others see something beyond even parallel war.[12] This paper takes a brief look at just one possible manifestation of American operational art. Finally, there is a subtle danger in oversimplification. Students of the school of nonlinear dynamics (more commonly known as the school of "Chaos Theory") warn

against using simplistic explanations based upon the prevailing mechanistic view of the world.[13] This paper only explores some of the most basic aspects of parallel war. Much more study is necessary. Nevertheless, there are some valuable insights available beginning with some theoretical and doctrinal concepts.

DEFINITIONS

> Not until terms and concepts have been defined can one hope to make any progress in examining the question clearly and simply and expect the reader to share one's views.
>
> Clausewitz[14]

Three concepts play important roles in understanding why airmen believe what they do about parallel war. The first, relatively simple, is a description of airpower from an airman's point of view. The next two, an overview of the air understanding of the nature of war and the background theory of simultaneous attack, require more elaboration.

First, this paper uses noted airpower historian Professor Richard Hallion's definition of airpower, namely, "the various uses of airborne vehicles and forces to achieve national needs by the projection of military power or presence at a distance."[15] This is quite a broad definition and takes into account cruise missiles, helicopters, remotely piloted vehicles, manned aircraft, and space assets to name only a few items. It is not service specific. The U.S. Air Force (USAF), because of its size and focus, obviously has a big input into air matters, and its opinion, as stated in service level doctrine, carries significant leverage. Nevertheless, to equate and limit airpower to a single service is too narrow a view.

A broader perspective also colors the air view of war. Lieutenant General Bradley Hosmer, USAF, then president of the National Defense University, wrote in 1987 that operational art cannot be equated to standard force application missions. The overall operational commander

focuses instead on how to manipulate his enemy for whole campaigns. This perspective is easily neglected, in his opinion, by concentrating too much on the tactical battlefield victory. Expanding on that thought, he believed the greatest payoff from using airpower comes when its inherent assets of flexibility, speed and range are properly exploited on a larger scale to positively blend with the overall joint/combined operational concept and campaign plan.[16] The same sentiment is expressed in the capstone Air Force doctrinal manual, AFM 1-1. It states, "The ability to concentrate force anywhere and attack any facet of the enemy's power is the outstanding strength of aerospace power."[17]

The natural question comes up: It sounds like range permits airpower to attack throughout a theater, but for what purpose? The "air" understanding of war provides the answer. Clausewitz said "war is thus an act of force to compel our enemy to do our will."[18] Who among the enemy do we compel and how? Clausewitz points out there are two components of resistance:

> If you want to overcome your enemy you must match your effort against his power of resistance, which can be expressed as the product of two inseparable factors, viz. *the total means at his disposal* and the *strength of his will*. . . the strength of his will is much less easy to determine. . . [emphasis in the original].[19]

Clausewitz goes on to provide advice on how to attain one's objectives in war. He says if one controls the enemy's armed force, his country, and his will, the one so controlled will be compelled to do the others' bidding. Specifically, one must destroy the fighting forces (defined by him as put in such a condition that they can no longer carry on the fight), and occupy the country. He then provides a caution. He said meeting the first two conditions was not enough,

> Yet, both these things may be done and the war. . . cannot be considered to have ended so long as the enemy's *will*

> [emphasis in original] has not been broken: in other words, so long as the enemy government and its allies have not been driven to ask for peace. . . .[20]

Influencing the minds of the decision makers in the government and compelling them to do our will is thus the central objective of war. Airpower analyst Dennis Drew commented that airmen must understand that "the objective of war is not military victory. Rather, the objective is to attain the political objectives which spawned the war. Military victory is merely one means to political ends."[21]

In Air Force doctrine, this understanding is articulated so that airmen are charged with working in concert with the overall combatant commander's intent and direction, either via an independent effort using air capabilities or in conjunction with surface operations, to meet the strategic goals. Because of the potential for airpower to range throughout the theater, priorities should focus first on the war, second on the campaign, and third on the battles.[22]

By way of contrast, a look at the U.S. Army (USA) view is instructive. The Army also understands the importance of focusing on the strategic objective but, where the Air Force puts emphasis on a theater view, the Army puts more of its emphasis on the tactical battle. For example, the soon to be released revised Army capstone manual, FM 100-5, Operations, states, "The arrangement of tactical battles and engagements over time and space to achieve strategic aims is operational art."[23] Another example of this battle focus is found in the Army corps operations manual:

> . . . the primacy of close operations must be recognized. Unless the corps commander is able to win key engagements at the FLOT, [Forward Line of Troops - author] he will not benefit from rear or deep operations, no matter how successful.[24]

This Army perspective is as natural and understandable as the Air Force theater wide view. The point is there is nothing inherently "good" or "bad" about such views – they simply "are"; they reflect the world view engendered by the environments the services operate in.[25]

A theater perspective affects the third topic – simultaneity. Clausewitz and U.S. military doctrine have quite a bit to say about simultaneous attacks. Clausewitz believed simultaneous attacks were theoretically preferable but probably not realistic. Speaking theoretically he wrote that, "If war consisted of one decisive act, or a set of simultaneous decisions, preparations would tend toward totality" but, he continued, "the abstract world is ousted by the real one and the trend to the extreme is thereby moderated." He went on to say, "But, of course, if all the means available were, or could be, simultaneously employed, all wars would automatically be confined to a single decisive act or a set of simultaneous ones. . . Any subsequent military operation would virtually be part of the first. . . ."[26] He comments further on this in his chapter, "Unification of Forces in Time," where he wrote, ". . . all forces intended and available for a strategic purpose should be applied *simultaneously* [emphasis in original]; their employment will be more effective the more everything can be concentrated [into] a single action at a single moment."[27] Clausewitz does discuss the idea of continuous application of violence in order to make sure the enemy understands the unpleasant situation is not transitory,[28] but he does not link the two probably because both continuous and simultaneous attacks were not realistic options given the technology of the time.

Doctrinally, both surface and air forces have addressed simultaneity and come up with different understandings of the concept. The Army acknowledges the reality of simultaneous attack as the "essence of AirLand

Battle. . . to defeat the enemy by conducting simultaneous offensive operations over the full breadth and depth of the battlefield."[29] This battlefield focus contrasts with AFM 1-1 which also examines simultaneous attack but with a theater perspective:

> Because aerospace forces can be employed in a variety of ways, at any chosen time, and against any target within their operating radius, they can be employed at all levels of war. They can undertake high-leverage strategic operations in independent campaigns. They also may be applied at the operational and tactical levels. . . Given sufficient superiority in numbers. . . all three types of operations may be pursued simultaneously.[30]

This section explored the definition of airpower and theoretical and doctrinal underpinnings of the air perspective in preparation for understanding what parallel war is all about and its applicability to American operational art. One other component needs attention -- the experiences of war, the ultimate validation of ideas. The analysis thus continues with an examination of serial war in order to establish a baseline against which to compare and contrast parallel war from the airmen's viewpoint.

SOUTH WEST PACIFIC / WW II - SERIAL WAR

Airmen consider General MacArthur's New Guinea campaign to be a textbook example of the proper use of airpower in a theater.[31] This section sets the strategic and operational context for the campaign and discusses how MacArthur's eventual pattern of operations evolved.

In mid 1942 the Japanese were pressing their advantage. Their victories at Pearl Harbor (December 1941), Singapore (February 1942), and the Philippines (May 1942) had pushed the allies back to Australia (see map A). The Japanese planned to create a defensive perimeter to protect their new sources of vital raw materials and the lines of communication back to Japan. Inside of this perimeter the Imperial Navy, backed by land-

based air, would use interior lines to counter any allied thrusts.[32] The Japanese had, in their opinion, four vulnerabilities. First, they had to preserve their naval strength. Second, the allied air strength had to be checked. Third, their overall plan must succeed before their two year supply of fuel ran out. And, lastly, they had to stop the expected allied thrust at Japan by way of the Solomons, New Guinea and the Philippines.[33] The Japanese looked specifically at moving strong forces into southeast New Guinea to set up a base to watch for the expected allied counterattacks but decided instead to focus on the North and Central Pacific areas. The result was the battle of Midway in June 1942.

This was a fortunate decision for the allies. Prior to this period, the allies in the Southwest Pacific Area (SWPA) were busy reorganizing after their string of defeats at the hands of the Japanese. General Douglas MacArthur, commander of the SWPA, had developed his overall strategic concept during his retreat from the Philippines. He wanted to return to the Philippines by way of a series of advances along the northern coast of New Guinea under the cover of land-based bombers.[34] He would coordinate his actions with Admiral Nimitz, commander of the Central Pacific area, under the strategic direction of the Joint Staff. The overall goal was to keep the enemy guessing as to where the next attack would come thereby negating his initial interior lines advantage -- the Japanese would have to defend everywhere while the allies could pick the location to mass their troops.[35] The main stumbling block to initiating operations in the SWPA was the poor condition of MacArthur's forces.

MacArthur realized he needed a strong joint team to fulfill his plans. What he found in early 1942 however, was that all the elements under his command were inadequate. MacArthur wrote that the naval force was too small and of the wrong types, the ground troops were poorly

equipped and lacked proper training, and the air forces were below the required standard.[36] Taking the analysis of the air situation a step deeper, the research shows MacArthur was, at this critical early stage, very disappointed in his air forces. He found their organization in need of overhaul and the training well below standard, needing "many months of intense effort" to reach satisfactory condition.[37] Insufficient and poorly maintained aircraft, haphazard pilot training, combat fatigue, and a lack of armament and armor were all pressing problems.[38] He wanted to gain air supremacy, but, based on what he had, he predicted the air effort would "fail, and as a result, the war would be indefinitely prolonged."[39] MacArthur felt a change in air leadership was necessary. He asked that a new man replace Lieutenant General George H. Brett, commander of Allied Air Forces. Major General George C. Kenney came to take charge of the air effort in a change that would quickly have far-reaching ramifications.

New Guinea was soon to become the next area of contention between MacArthur and the Japanese. As both sides pondered their initial moves, they began to develop a growing awareness of the potential value of airpower. It was here, post-war reports state, that Japanese thinking became driven by "recognition of the decisive importance of air power."[40] Seizure, especially of Port Moresby on the southern coast of New Guinea, would deprive allies of a potentially important airbase and forestall a "prolonged aerial stalemate, which would tax Japan's limited aircraft production resources."[41] Additionally, New Guinea would bolster their strategic defense by providing aerial reconnaissance over areas the allies would probably use to counter-attack, deprive the allies easy access to a forward base for their counter offensive, and put pressure on northeast Australia and hinder allied air operations.[42] This then was the mindset of the Japanese as they moved to control New Guinea (see map B).

MacArthur also valued New Guinea from an air perspective because he needed it as an initial base for bombers to cover the amphibious attacks throughout his area. He also wanted to take advantage of the Japanese main focus being on Guadalcanal in the Solomon Islands. For a time New Guinea would be their secondary effort and he would have a better chance securing the airbases at Port Moresby in the south and Buna along the northern coast. The stage was now set and the first step in the battle for initiative and momentum in the SWPA was about to begin.

MacArthur formulated a campaign approach he termed "three-dimensional warfare - the triphibious concept" where he combined all service capabilities into an effective whole.[43] Airpower slowly became the central focus of the campaign starting with the struggle for Buna. At this key battle MacArthur wanted to shift from the defense to the offense and, through a tactical battle, regain flexibility and momentum in the theater.

In May and June 1942, 12,000 Japanese troops landed at Buna and began marching southwest across the Owen Stanley mountains to take Port Moresby. Kenney wanted to win the most critical fight first and thus give priority to gaining air control. In a conversation with MacArthur, Kenney's position was,

> I wanted to carry out one primary mission, which was to take out the [Japanese] air strength until we owned the air over New Guinea. . . there was no use talking about playing across the street until we got the [enemy] off of our front lawn. . . our reconnaissance aircraft would be constantly looking for [Japanese] shipping that should be hit. . . but we were not going to get anywhere until we had won the air battle. . . .[44]

Kenney therefore concentrated airpower to attack the main Japanese base in the sector, Rabaul, and to attack the Japanese fighters and bombers first. Control of the air was his primary concern and interdiction, airlift and close air support were secondary efforts.

Allied airpower achieved mixed results during the battle for Buna. The close air support was clearly weak and tainted with incidents of fratricide.[45] Both air and surface forces lacked the radios, training and doctrine to safely and effectively integrate air strikes.[46] There were also problems with sustained logistical support. Lieutenant General Eichelberger, commander of the USA 32nd Division fighting for Buna, reported that although critical levels of food, ammunition, and clothing were met, air was never able to fulfill the 30 days of supply they had agreed to provide.[47] Sea and ground interdiction efforts had slightly better results. B-17 radar reconnaissance was often successful in finding Japanese shipping and guiding the bombers to the convoys and, by 15 December 1942, the Japanese abandoned all destroyer movement to Buna.[48] Air attacks also enjoyed some success against ground movement. Prisoner comments such as "Our troops do not come. Even though they do come they are driven away by enemy planes. . . ," and, "Enemy planes unbearable today," attest to some positive effectiveness.[49] However, airpower's biggest payoffs would come from efforts far from the ground battles.

Allied air showed surprising strength in the airlift and airdrop areas and in mounting an effective aerial offensive against Rabaul. For example, an entire U.S. regiment was quickly airlifted by Kenney's forces from Australia to New Guinea in the largest operation ever of its type despite the loudly voiced skepticism of MacArthur's staff.[50] After that move, airdrops of supplies to allied troops fighting the Japanese in the Owen Stanley mountains during bad weather conditions became important. Kenney himself refined the flying procedures to the point that aircrews were soon capable of dropping 300 pound supply bundles from 2500 feet altitude into 100 yard diameter clearings in the jungle.[51] Kenney also took the fight to the main Japanese base at Rabaul. Within three days of

assuming command, Kenney launched the largest bombing raid up to that time against Rabaul -- much to MacArthur's pleasure.[52] Kenney evaluated the overall impact of airpower at Buna and wrote,

> We owned the air over New Guinea. We were bombing and machine-gunning his troops and burning up his supplies. We could supply by air, while the [Japanese] had to run an air blockade with his vessels every time he wanted another bag of rice, another round of ammunition, or another soldier to replace his losses.[53]

From a larger "triphibious" perspective, the allies learned much from their first offensive. The initial movements were marked by innovative air-surface coordinated activity which kept the enemy off-balance. Unfortunately, the enemy proved to be a tenacious defender. The allied frontal assaults in the dense jungle against the dug-in defenders incurred horrendous casualties. In fact, the fight for Guadalcanal, occurring at essentially the same time and itself regarded as a very tough, bloody battle, was not as costly as the battle for Buna.[54] MacArthur learned from Buna and began refining his approach in the battles following Buna's fall in January 1943. He did not go directly to the "bypassing" concept. Rather, he expanded the tempo of his operations and conducted deeper attacks led by the air forces to envelop and destroy successive concentrations of enemy along his desired line of advance. MacArthur would show, during the battles of the Bismark Sea, Lae, and Hollandia, an increasing understanding of airpower's virtues of range, speed, and lethality. Rapid, deep, isolating attacks to hit the enemy and keep him off balance became the defining characteristic of the campaign.

A remarkable sea battle right after Buna soon opened the eyes of many about the ability of airpower to further disrupt the Japanese efforts in the theater. The Japanese became alarmed at the threat to their flank with the loss of Buna and decided to reinforce their positions further back

along the New Guinea coast. They soon found, however, that allied air attacks were a major threat to their transport operations. In late February and early March 1943, major elements of the 51st Division sailed from Rabaul to New Guinea on eight transports escorted by eight destroyers and one hundred aircraft. Kenney's reconnaissance planes found the convoy and it was attacked by a massed formation of allied bombers and fighters. In the three-day battle of the Bismark Sea, the Japanese fighter cover was driven off, fourteen ships were sunk, and of the 6,900 soldiers who left Rabaul only 800 made it to New Guinea.[55] MacArthur wrote that this battle was critical because the Japanese forces were "deprived of supplies and reinforcements necessary to withstand the forthcoming Allied blows. . . Control of the air and sea lanes had passed to the Allies, marking the end of the Japanese offensive in the Southwest Pacific."[56] Where Buna was a fight to stabilize the situation, the battle of the Bismark Sea saw the tide turn in favor of the allies.

What happened at the Bismark Sea was special for another reason too. Historian and Pacific War expert Ronald Spector noted,

> Kenney's planes had finally achieved what General Billy Mitchell had so breezily predicted fifteen years before. They had destroyed an enemy fleet at sea unaided by naval surface forces. . . The principle was established. Air power was clearly the dominant element in the southwest Pacific. . . .[57]

The Japanese analyzed their overall situation in the aftermath of this newest defeat. In their estimation,

> Various factors were responsible for the parallel setbacks suffered by the Japanese forces in Papua [New Guinea] and the Solomons, but the most important of these was the gradual loss of air supremacy over the areas of battle to the Allies.[58]

Based upon this estimate of the situation, the Japanese decided to conduct a strategic withdrawal and establish a new defensive perimeter to counter the next wave of expected allied thrusts.[59] The allies, through battle

experience, had begun to exploit their airpower and push the Japanese back on the defensive.

MacArthur and Kenney wanted to keep up the pressure and not let the Japanese establish their defenses. Kenney understood MacArthur's vision and considered where the allies should strike next. He wrote,

> Ever since we first began to talk about capturing Lae and Salamaua, back during the Buna campaign, we had been looking for a place to build an airdrome close enough to Lae so that our fighters could stay around to cover either an airborne or seaborne expedition. . . .[60]

Because of his anticipatory thinking, Kenney discovered a location near Wau from which the allies could strike at the Japanese air forces stronghold at Wewak (see map C). There was no airfield at his desired location but it was flat and could be turned into an airfield in short order. Because no airfield yet existed there, Kenney conceived of a deception plan which would lull the Japanese into thinking the allies were out of range and unable to attack their air field complex. He secretly had the airfield constructed without the Japanese discovering it and had fighters and medium bombers flown in. On 17-18 August 1943, Kenney had 122 bombers with a large fighter cover strike the Wewak complex. The Japanese were caught by surprise and almost 175 planes were destroyed. MacArthur said of the raid, "It was a crippling blow at an opportune moment."[61] MacArthur's staff reported Japanese prisoners felt the allied air attacks on Wewak caught them completely by surprise because of its "scale and suddenness," and that the raid, ". . . rendered the enemy's margin of air superiority so decisive that all phases of the Japanese military effort in New Guinea were severely affected."[62] With this raid the Japanese air threat was removed and allied air superiority was assured for the upcoming landing at Lae.

At Lae MacArthur hoped to cut off and destroy the remnants of Japanese forces fleeing from southeast New Guinea. His confidence in Kenney's air forces was growing and he now wanted to employ a concurrent airborne and seaborne assault. He ordered a regimental paratroop airdrop, the first of its size and scope in the war, to attack Nadzab airfield west of Lae to seal off the Japanese while other allied units landed on the coast. The third prong was an overland thrust by the Australians to drive the Japanese into the converging American forces. The paradrop operation, according to MacArthur, went like clockwork and was "the most perfect example of discipline and training he had ever seen."[63] The Japanese again withdrew as their surface forces unsuccessfully tried to cope without air support against the relentless allied "triphibious" assaults.

By this time the outline of an allied pattern was emerging. MacArthur would, working with Kenney, base his attacks on the range of his fighter force. He would try to extend that range through the use of deception and attack where not expected. He would then use his air to take out the biggest threat to his amphibious avenues of approach which was normally the opposing air and naval forces. Finally, he would build or extend airbases at the new location and start the step-by-step process again.

The overall goal of all these operations was to position the allies to capture the Japanese stronghold of Rabaul. This goal changed in August 1943, during the battles at Lae and Salamaua. New directions from the Joint Chiefs in Washington told MacArthur and Nimitz to neutralize rather than capture Rabaul. MacArthur initially fought the plan but General Marshall convinced him to develop and integrate new plans with the Central Pacific forces. MacArthur's biographer, historian D. Clayton

James, said that "once converted, no commander exploited bypassing more brilliantly than MacArthur."[64] The final piece of MacArthur's campaign pattern was about to be put in place.

After the war MacArthur's staff in Japan wrote a report describing this transition. They noted that on 17 February 1944, an allied carrier task force attacked Truk and all naval air units left Rabaul to join in the battle. Rabaul was then bypassed in a surprise move which saw MacArthur attack instead at Los Negros in the Admiralty Islands 365 miles northwest of Rabaul and 250 miles father into Japanese held territory than any previous penetration. Los Negros was on the main supply route to Rabaul and had served as an intermediate air stop. By March 1944, Rabaul was isolated despite over 300,000 army and navy forces having been sent into the battle. Approximately 175,000 personnel had been bypassed and isolated ". . . and were henceforth unable to make any significant contribution to the war effort."[65] This approach, blended with the prior pattern of operations, would be MacArthur's trademark as he made larger and larger leaps around Japanese strong points. In April 1944, for example, Kenney's air forces destroyed over 300 Japanese aircraft which had moved in to reinforce Hollandia. Their attacks effectively removed the major threat to the pending allied assault on the Japanese rear area stronghold at Hollandia. The Japanese were caught completely off guard by MacArthur's 500 mile jump and the base, a key headquarters and logistics facility with a fine port, quickly fell and, in turn, served as another jumping off point.[66]

The overall impact of this serial approach was devastating to the Japanese. Maj. Gen. Shigeyasu of the Second Area Army said,

> By advancing to Hollandia (direct). . . the Allies cut the length of time required by one-third. Had they advanced (as expected) we would have had time to prepare the defenses. . .

> As it was, there was very little time to prepare. . . Biak [next key target beyond Hollandia] was placed well within bomber range.[67]

Pacific War historian Robert Ross Smith also concluded these rapid and deep advances, spearheaded by and built around allied airpower, shattered Japanese efforts to effectively counter the allies.[68]

Several general trends, begun at Buna, refined at the battles of Bismark Sea and Lae, and extended at Hollandia, emerged and continued in many similar later operations.

General Trends from SWPA

Eventually the strategic vision, acted out in concert with the Central Pacific effort, was successful in defeating the Japanese. It seems there were three key reasons for the success: service component strengths were exploited to increase allied options; a broad vision and the leadership to bring that vision to reality existed; and, MacArthur's gradually growing appreciation for, and application of, airpower in his theater.

MacArthur adeptly exploited the capabilities of each of his components with his "triphibious" approach. Airpower's role was uncertain at first. Its effectiveness in close direct support of allied ground troops was limited. It seemed the best way to use air to help the surface effort was to focus its power on setting the overall conditions for success. This was done by using airpower's range, speed, and firepower to increase the number of options available for landing allied ground forces while, at the same time, reducing options for the enemy. Allied airpower, when properly applied, gave the allies more flexibility than the Japanese. The allies were still limited by range to a step-by-step approach but it was relatively effective for its time.

What perhaps made the allies more effective than the Japanese was the skillful implementation of MacArthur's operational vision. MacArthur matured and learned from his experiences, especially at Buna and the battle of the Bismark Sea. He sought thereafter to isolate the operational theater and retain his freedom of maneuver while limiting that of the Japanese. According to James Schneider, professor of military theory at the U.S. Army's School for Advanced Military Studies, such activities define modern operational art.[69] MacArthur's operational vision grew over time. He had his overall strategic concept but his horizon seemed to expand from a tactical view at Buna to a progressively larger one for each operation such as at the Bismark Sea, Lae, and Hollandia. Much of the change in perspective seems to have come about because of experiences with his air commanders.

Under Brett, the air commander before Kenney, air was ineffective and MacArthur was quite pessimistic. At one point MacArthur described the air forces as an "inefficient rabble. . . whose contribution to the war effort was practically nil" and whose personnel were "antagonistic. . . to the point of disloyalty."[70] Thus airpower's usefulness in the campaign, at least in MacArthur's mind, was not a given. Airpower is a system where people manipulate complex machines to exploit the aerial dimension of war. The key to effective system performance is the people and leadership is the key to gaining their effectiveness.

Airmen have paid a lot of attention to Kenney's leadership. Under Kenney, MacArthur's air instrument turned around, partly because of Kenney himself and partly because of his relationship with MacArthur. When Kenney first came in he fired five generals in the first week and cleaned out his staff to man the flying units. He stressed aircraft maintenance and flying training to build a solid operational foundation

and emphasized, above all else, taking the fight to the Japanese. His offensive spirit impressed his troops and MacArthur. He set the tone of his command early when, just three days after taking command of the "ineffective and practically useless" allied air forces, he conducted the largest bombing raid up to that time on Rabaul.[71]

Kenney confronted skeptics on MacArthur's staff in the same aggressive manner. In one famous incident with Major General Sutherland, the chief of staff, he clearly established who was the air commander,

> On the first day in command of the Allied Air forces, Kenney's orders for an air attack were returned by Sutherland with the numbers of aircraft, bomb tonnages, times for takeoff, and other details drastically altered. Kenney rushed to the chief of staff's office for an immediate showdown with him: he angrily took a piece of blank paper from the chief of staff's desk, put a tiny penciled dot in the corner, and informed Sutherland that the blank area represented his knowledge of air matters and the dot symbolized Sutherland's. Kenney firmly told the astonished chief of staff to rescind the orders that he had revised and not to interfere again with his command.[72]

What has this to do with serial war? Only that it seems the credibility of the ***airleader*** affects the credibility others give to ***airpower***. This was confirmed by the interesting relationship which developed between MacArthur and Kenney.

MacArthur soon came to value both the judgment of his air commander and his personality. Kenney proved himself competent and trustworthy and was also outgoing and good natured. The two men became friends; Kenney frequently visited the MacArthurs' apartment and was one of few people who felt free to call on them without notice. He and MacArthur had frequent informal discussions and late night decision making sessions.[73] This access, mutual respect, and trust, all built on solid performance, helped educate MacArthur about airpower as Kenney

assisted in the formulation of theater objectives. MacArthur once told a visiting dignitary that "I probably did the American Air Forces more harm than any man living when I was chief of staff by refusing to believe in the future of the airplane as a weapon of war. I am now doing everything I can to make amends for that great mistake."[74] MacArthur showed his mental flexibility by learning from Kenney and exploiting air to help shape his overall campaign.

The SWPA experience, while unique, nevertheless demonstrated a general trend of increasing effectiveness by using airpower to set the conditions for theater success. When the overall campaign started at Buna, people from MacArthur on down had doubts about what air could contribute. Those doubts were natural and were only overcome by improved performance and effective innovations. An understanding of airpower potential grew over time as new ideas were considered and tried. Eventually the vision of how far out to look in space and time for opportunities in serial war came to depend upon the capabilities of airpower. Tough tactical battles were fought by surface forces but the allies retained their operational triphibious approach against an enemy which had disintegrated into isolated tactical groups. The isolated enemy formations, while brave, determined, and dangerous, nevertheless were beaten, bypassed or made irrelevant. The SWPA campaigns inspired future airmen to consider how to apply airpower to contribute even more effectively toward winning wars. Their thoughts, expressed as theories and doctrine, provided the basis for the parallel war waged against Iraq in the Persian Gulf almost fifty years later.

DESERT STORM – PARALLEL WAR

> The United States relies on the Air Force and the Air Force has never been the decisive factor in the history of wars.
>
> Saddam Hussein (1990)[75]

Every conflict is unique. In this instance, the strategic and operational contexts were very different from that faced by the allies in World War II. Strategically, in 1990 the U.S.-led coalition faced Saddam Hussein, a dictator suspected of having weapons of mass destruction who crushed a smaller regional neighbor and threatened half of the known oil reserves in the world. His actions within an already volatile region made it a very difficult situation. Another factor was the breakup of the Soviet Union and the rise of the United States as the sole remaining world superpower. The crisis became a test of what would be acceptable in the new world order given improved U.S. relations with the Soviet Union and the United Nations (UN). A critical key to the entire strategic situation was the isolation of Iraq by the majority of the world community and the acceptance of U.S. leadership and involvement by Middle East countries. These key strategic factors would impact the operational environment.

Operationally, this conflict was very far away from the United States in an area that had significant available infrastructure. Coalition deployments, although a challenge in terms of time and distance, fortunately were mostly to well prepared ports and airfields. Opposing the coalition was a battle-tested and well equipped enemy poised on the Kuwaiti/Saudi Arabia border. The coalition likewise was well trained and well equipped; its main handicaps were its lack of battle experience and familiarity with each other, dissimilar equipment and doctrine, and the partnership nature of coalitions. The United States would face a critical

leadership challenge holding the coalition together and this factor would fashion much of its military operational thinking.

The United States was fairly well prepared for this crisis. Militarily, the United States had learned many lessons from World War II, the Korean war, and Vietnam. Both surface and air forces had revised their war-fighting theories and doctrines. On the air force side, Colonel John Warden wrote about planning air campaigns and linking strategic, operational, and tactical objectives. He drew many of his lessons and examples from what happened to MacArthur and Kenney in the SWPA. Specifically, he emphasized the importance of a theater view when employing airpower, the value of air superiority and the use of the offensive and deception to gain and maintain the initiative. He added his own perspective on how to obtain the best leverage from airpower by recommending the enemy be viewed as a system and attacking him accordingly.[76] Warden's views, as well as those in the other services, influenced the military perception of how to deal with the situation.

The coalition commander, USA General H. Norman Schwarzkopf, commander of Central Command (CENTCOM), had his own perspective as he made his initial read of the situation. According to historian Michael Palmer, who wrote one of the initial assessments of Desert Storm, Schwarzkopf understood the U.S. and the UN did not want to invade and occupy Iraq. The carefully crafted coalition probably would not have agreed to such a goal. Yet, Palmer pointed out, the "allied unwillingness to march to Baghdad. . . posed special dilemmas" particularly since Saddam Hussein's strategic assets (command and control, power generation, and nuclear, biological and chemical facilities, etc.) were in Iraq, not Kuwait.[77] Airpower became, for political reasons, the primary conventional military instrument for attacking these critical strategic

targets inside Iraq. Schwarzkopf, Palmer continued, had realized this early in the crisis and on 8 August 1990, requested air planning assistance from the Air Staff.[78] The commander of Central Air Forces (CENTAF), Air Force Lieutenant General Charles Horner, was not called on initially to do this planning because he became commander of CENTCOM forward and his staff was consumed with managing the flow of troops into Saudi Arabia.

The Air Staff responded to Schwarzkopf's request by having Colonel Warden of the Air Force's Checkmate office in the Pentagon analyze the situation. Checkmate is the Air Force's threats and wargaming section and it had already started to brainstorm options on how to respond to the Iraqi invasion of Kuwait. In less than a week, according to Schwarzkopf, Warden and his planners briefed him on a good plan which focused airpower on hurting the Iraqi leadership and military without destroying Iraq in the process.[79] The plan was called Instant Thunder. Warden picked the name because, being a fighter pilot and a veteran of Vietnam, he wanted to do what he could to make sure there would not be a repeat of the frustrating and ineffectual gradual approach typified by operation Rolling Thunder during that war.[80] The plan called for strikes at Iraqi command and control capabilities and the known nuclear, biological and chemical (NBC) storage sites and production facilities. The plan also hit hundreds of other targets to include the air defense network, ammunition storage sites, oil and electrical production centers, bridges and railroads.[81] The goal of this initial plan was to retaliate against Iraq if they attacked into Saudi Arabia by conducting a strategic air attack to disrupt Iraq's ability to command, control and sustain offensive operations.

Schwarzkopf liked the plan but felt it needed to be fleshed out from just a retaliatory attack into a full offensive air campaign. He called General Colin Powell, Chairman of the U.S. Joint Chiefs of Staff, and

described a four phased campaign: First, Instant Thunder; second, the suppression of air defenses over Kuwait; and third, the air attrition of the enemy force in Kuwait by fifty percent. The fourth phase, a ground attack, was not a real option in the early stage because of insufficient ground forces.[82]

When developing Instant Thunder, Warden's planners kept two key thoughts in mind. What was the desired end state the coalition and the U.S. wanted? And, what were the asymmetries between the coalition and Iraq and how could they be exploited?[83] The end state was clear: the expulsion of Iraqi forces from Kuwait and the restoration of the Kuwaiti government. The best way to achieve the objective at the least cost was to exploit the asymmetries between the opposing airpower capabilities (which includes space assets per this paper's definition). Although Iraq had the world's sixth largest air force, the allies had some advantages. They could tap into accurate space communications, weather tracking, and navigation systems. On aircraft, intelligence gathering systems existed that could take photos of vehicles 135 kilometers away and accurately identify them.[84] The allies had precision munitions which were much better than the Vietnam era weapons which had hit bridges and individual vehicles. The planners also took advantage of the potential for surprise from low observable technology that made it much more difficult for enemy air defenses to acquire and track attacking aircraft. The allies also had a tremendous electronic countermeasure capability that, properly applied, would enhance the entire air effort. Overall, the allies possessed an air arm for use against Iraq that was much more diverse and capable than that MacArthur and Kenney had in World War II (see table-Appendix A).

Schwarzkopf took Warden's plan with its focus on achieving the end state and exploiting asymmetries and turned it over to Horner and his planners at CENTAF with orders to mold it into an executable theater air campaign. The initial Instant Thunder plan was a sequential, serial, approach that first hit 84 strategic targets in seven days. It then shifted to obtaining control of the air over Kuwait in one day to enable follow-on air attacks against Iraqi forces in Kuwait. Schwarzkopf, in his first meeting with Warden on 16 August 1990, explored the possibility of striking the Iraqi Republican Guard forces in Kuwait at the start of the strategic air attack. Warden believed that would be too dangerous because the air defenses would still be operational and would likely cause extensive losses to the Coalition air forces. Schwarzkopf understood that and also wanted to avoid unnecessary losses but still felt the idea of simultaneous attack ought to be explored further by his own staff.[85] Michael Palmer reported that Warden's concept of operations remained fairly intact. The major adjustments were to take Warden's plan and make it more surgical and shift some attention to Iraqi ground forces. It was thought by Brigadier General Glosson, the chief CENTAF planner, that while Instant Thunder provided a solid planning foundation, it was somewhat overly ambitious and too Air Force biased.[86] Glosson took the plan, with its serial war, step-by-step approach, and began to turn it into a simultaneous approach which would hit the Iraqis continuously.[87]

In November, with the announcement that Coalition forces would grow to prepare for the possibility of offensive operations, Glosson received guidance to plan for more assets and to adjust the air campaign accordingly. More assets gave Glosson the ability to simultaneously attack what CENTCOM determined were the three Iraqi centers of gravity: first,

the command, control, and leadership of the Hussein regime; second, the Iraqi NBC capability; and third, the Republican Guard.[88]

Based on the three centers of gravity, the air planners (a combined/joint staff comprised of allies and each U.S. service), identified five air campaign objectives. These were:

* Isolate and incapacitate the Iraqi regime.
* Gain and maintain air supremacy to permit unhindered air operations.
* Destroy NBC warfare capability.
* Eliminate Iraq's offensive military capability by destroying major parts of key military production, infrastructure, and power projection capabilities.
* Render the Iraqi army and its mechanized equipment in Kuwait ineffective, causing its collapse.[89]

The simultaneous attack to achieve these objectives would send a single wave of airpower "systems," (space, unmanned vehicles, electronic combat assets, missiles, etc.) to overwhelm the Iraqi air defenses and minimize coalition losses. The smaller losses translated into more aircraft and airpower systems available for later strikes.[90]

These attacks were further broken down into strategic, operational, and tactical targets. The plan used all available assets to their best ability in an attempt to paralyze the Iraqis and allow the Coalition freedom to maneuver wherever they pleased.[91] The plan was very complicated because the Iraqis had a very good air defense system; it was by no means helpless. Baghdad, according to Professor Hallion, aerospace historian and author of Storm over Iraq, "had seven times the density of defenses as Hanoi had during Linebacker II, and defenses denser than the most heavily defended Eastern European target at the height of the Cold War."[92] He went on to note that, "So dangerous was downtown Baghdad that the air campaign planners excluded all other attackers, except for F-117s and

cruise missiles, from striking it."[93] The DoD final report also noted Baghdad was more heavily defended than Murmansk in Russia and that the air defense system protecting Iraq had 3,679 missiles, 972 antiaircraft artillery sites with 2,404 guns augmented by a further 6,100 mobile guns.[94] Air planners thus faced a very serious challenge and would soon see their plan put to the test.

Diplomatic efforts continued while the planning was going on. A January 1991, deadline was set by which time Hussein had to leave Kuwait. That time came and went and the coalition, lead by President Bush and supported by United Nations resolutions, went on the offensive in the early hours of 17 January 1991, to force Iraq from Kuwait and restore the legitimate government.

The limits of language make it difficult to adequately describe all that happened in the first minutes and hours of the air attack. It was very different from the serial attacks used by MacArthur and Kenney. There was no step-by-step methodology that found the enemy, depended on favorable conditions to hit him, brought in surface forces to establish new bases, rearmed, and started the whole process over. Rather, every available asset was used in a carefully orchestrated massive attack on targets throughout Iraq and Kuwait.

In the first day, enemy forces and targets in Iraq and Kuwait were hit with 116 Tomahawk land attack cruise missiles (TLAMs) fired from naval surface and subsurface vessels, 35 air launched cruise missiles (ALCMs) from B-52's which took off from as far away as the U.S., and nearly 700 combat aircraft. Three different attacks occurred near simultaneously. The first was an attack by a joint USA AH-64 Apache/ USAF MH-53J Pave Low special operations helicopter task force which took out a critical node of the Iraqi early warning radar system. The second

attack, thirteen minutes later, was done by a wave of 30 individual F-117 stealth fighter bombers attacking command, control, and communications facilities in downtown Baghdad. Lastly, but at the same moment, 54 TLAMs and 35 ALCMs hit NBC facilities, electrical power and transmission sites, and key government buildings in Baghdad and throughout Iraq. All told in the first five minutes, nearly 20 targets in Baghdad were hit; 45 targets were hit within the hour.[95]

Even more was happening during the first hours. Other B-52 bombers struck at the Republican Guard in attacks that went on every three hours for the next forty-three days. Air superiority fighters took on any Iraqi aircraft trying to stop the attacks. Eventually 35 Iraqi fighters were shot down in air-to-air combat with no confirmed allied fighter losses. Electronic warfare systems jammed and confused Iraqi radars and, using anti-radiation missiles, knocked many of them out of commission, opening more holes in the air defense network. Other fighter bombers such as the U.S. Marine and Navy F/A-18, A-6, A-7 and USAF F-16s attacked airfields and targets on the outskirts of the city.[96]

All the initial attacks focused on the strategic goal of paralyzing the Iraqi leadership and interrupting their ability to conduct sustained offensive operations. The special operations attack on the front line Iraqi radar, a tactical event, opened the door for operational and strategic level attacks against regional sector operations centers and the headquarters of the entire air defense system. Those attacks in turn helped make the simultaneous air interdiction attacks against the Iraqi road and rail bridges less risky and much more effective.

The attacks were not only simultaneous but "near" continuous. They were "near" continuous because bad weather proved it could still interfere with flights, bombing accuracy, and intelligence gathering. Yet

the interference was not absolute; even the worst weather in the region in 14 years was only able to reduce air sorties by one third.[97] Night operations, one of the big limitations in the serial campaigns of the SWPA, had become much less of a factor. Precise navigation aids such as the space based Global Positioning System (GPS) when coupled with the on board Low Altitude Navigation and Targeting Infrared for Night (LANTIRN) system and night vision goggles made night attacks much more safe and accurate.

Contributing to much of the success of night attacks were the coalition Airborne Warning and Control System (AWACS) and Joint Surveillance Target Attack Radar System (JSTARS) aircraft. JSTARS, for example, uses a phased array radar to detect, locate, classify and track both moving and fixed surface targets. It is designed to look out to 225 kilometer and transmit the data to USAF and USA command centers. During the conflict, analysts from Jane's Information Group, noted that ". . . strike aircraft directed by JSTARS found some 90 percent of their targets on the first pass."[98]

Two other factors made near continuous attack a reality: air refueling and maintenance reliability. The USAF deployed 302 tankers to the war, and performed 45,955 in-flight refuelings.[99] This capability allowed for longer loiter time over targets, less airbase congestion, and efficient attack flow plans. Maintenance reliability was also very helpful. As James P. Coyne, author of the comprehensive Airpower in the Gulf wrote, "U.S. Air Force aircraft achieved mission capable rates equal to or better than in peacetime, and did so while flying more sorties per day."[100]

All these various factors combined to give General Schwarzkopf a never before available means to conduct precise and lethal simultaneous and near continuous attacks against the strategic, operational, and tactical

targets he determined were the most significant. The next section describes his impression, and that of other civilian and military leaders, about this different approach to war.

Impressions on Parallel war

Many people looked at this display of military action in the Persian Gulf and were either impressed, convinced it ushered in a new era in warfare, or cautioned against making too much out of it. Schwarzkopf said,

> Horner had done an extraordinary job. . . By the last week in January, the skies over Iraq belonged to the coalition. We were accomplishing exactly what we had set out to do: cripple Iraq's military system while leaving its agriculture and commerce intact and its civilian population largely unharmed. . . I knew we'd defeat them - but I didn't know how bloody the ground war might be.[101]

Horner said, "By the end of the first day , the stage was set for the crushing defeat of the Iraqi military."[102] Professor Hallion was convinced major damage was done to Iraq in the first ten minutes. He compared what impact a similar strike on the United States might have and concluded it would have been devastating.[103]

Warden, architect of the central core of the air campaign, felt the simultaneity and near continuous attack constituted a revolution in war by virtue of the strategic and operational paralysis it imposed. The allies retained operational freedom against what became isolated tactical Iraqi units.[104]

The then Soviets had a mixed reaction to the coalition campaign in Desert Storm. Captain Brian Collins, aerospace analyst with the military studies group at Supreme Headquarters Allied Powers Europe, wrote that from his examination of Soviet writings it seemed, "the Soviet high command remained generally unpersuaded, even skeptical, that airpower

had achieved a new and dominate position in warfare."[105] Gilberto Villahermosa, of the Foreign Military Studies Office (FMSO) at Ft. Leavenworth, picked up a different view. While some Soviet writers stressed the continued pre-dominance of surface forces, the majority of others felt differently. The faculty chief at the General Staff Academy concluded that,

> . . . the outcome of the war had already been determined in its first minutes by the ability of allied air forces to seize the initiative in the air and win air superiority from the outset.[106]

Colonel David Glantz, director of FMSO, wrote in the summary of Villahermosa's study that,

> Soviet anxiety over the poor performance of specific Soviet weapons and integrating systems will probably pale beside their realization that modern high-precision weaponry, artfully and extensively applied, produced paralysis and utter defeat. . . .[107]

A German military observer had a similar insight. LTC Zehrer, an instructor at the International Military Academy at Hamburg and editor of a book on the war, said Desert Storm represented a new "dimension of [the previous] operational concept: to fight with high tech weapons from secure areas until ready to sweep the enemy from the battlefield. This is a historical change from the World War II way of thinking. It is a C^3I [command, control, communications, and intelligence - author] counter concept."[108]

Senior civilian leadership in DoD and civilian analysts overseas also thought they saw something new. The DoD report to Congress addressed the technology involved in stand-off precision weapons, sophisticated sensors, stealth for surprise, and survivability and night vision capability (among other examples) and stated, "the exploitation of these and still-emerging technologies promises to change the nature of warfare

significantly, as did the earlier advent of tanks, airplanes, and aircraft carriers."[109] Analyst Roland Dannreuther of the International Institute for Strategic Studies wrote the simultaneous attacks forced the Iraqis to try to engage the coalition in a ground battle at Khafji. The overwhelming, around-the-clock firepower brought to bear on them by the coalition convinced the Iraqi's that their situation was hopeless.[110]

USA and U.S. Navy commentators had their unique points of view. Army Colonel Douglas Craft, a CENTCOM planner during Desert Storm, pointed out the need for balance between overestimating and underestimating the value of airpower. In his opinion, air operations did measurably contribute to meeting objectives at the strategic, operational, and tactical levels. The known NBC threat was badly damaged, the Republican Guard was blinded and rendered ineffective as a maneuver force, and other Iraqi forces were badly hurt and their will broken making the subsequent ground offensive that much more successful and less bloody.[111] The Army was not entirely satisfied with the air campaign however. Both the DoD final report and Professor Hallion recorded that the ground force commanders became increasingly vocal with their concerns that forces directly in front of them were not getting hit hard enough prior to the ground operations. This criticism of airpower is misleading, however, given the fact the air forces were responding to the established priorities and specific directions of Schwarzkopf, a four star Army general and the overall theater commander.[112]

The Navy likewise had some criticisms about the air campaign. One prominent civilian naval analyst, Norman Friedman, said that the Air Force and the Navy conduct air campaigns very differently. The Navy concentrates on penetrating defenses to make the point that worse could follow.[113] As seen previously, the Air Force planners under Warden

rejected the gradual approach espoused by the Navy, and sought to conduct a strong, sustained attack against key strategic, operational, and tactical targets to paralyze the Iraqi ability to effectively respond. Friedman also related a sense of resentment that Air Force planners demanded full four-dimensional (space and time) control over virtually all aircraft in the enemy's airspace. Navy planners acknowledged that the combat aircraft grouped with electronic and communications support aircraft needed a clear and comprehensive system to control routes to prevent fratricide. Yet the Air Force air tasking order system was described as "rigid," "a heavy burden," and, "inflexible."[114] Unfortunately, another Navy analyst admitted the Navy could offer no better alternative solution so the plan, with its perceived limitations, was used.[115]

These various perspectives demonstrate that any evaluation of Desert Storm and parallel war must reflect an appreciation for the context of the situation. Many factors enhanced the effectiveness of the air campaign and some factors hampered it. Airpower's effectiveness was bolstered by a desert environment which aided targeting. Additionally, Iraq had a rigid C^2 structure headed by Hussein, a militarily incompetent commander in chief. Hussein also gave the allies months to build up their forces and take advantage of the in-place Saudi infrastructure. On the negative side, the parallel war effort in the air was hampered by the worst weather in the region in 14 years. The environment further complicated matters because of the heat and sand which was hard on both personnel and equipment. The Iraqi defenses were very good, especially the air defenses, and were supplemented by a network of hardened bunkers. Additionally, many targets were in urban areas with the potential for collateral damage. The air campaign also had difficulties meeting the original planned time lines because of the diversion caused by trying to

hunt down Scud launchers. As always, each conflict sees a mix of advantages and disadvantages. But given this performance and compared to what happened in the SWPA, it is now time to discuss some general implications.

IMPLICATIONS

> . . . every war is rich in unique episodes. Each is an uncharted sea, full of reefs.
>
> Clausewitz[116]

Gary Cox, an airpower analyst at Air University, asserted in a recent article that noted historian Michael Howard was correct to counsel that military history be read in breadth, depth, and context.[117] Following that counsel, one must be cautious about a relatively recent conflict such as Desert Storm in which there was but 43 days of combat. That appropriate caution must be separated however from inappropriate fears. Larry Welch, USAF General (retired) and previous Chief of Staff, recently remarked that "too many conceptions of how to use air power are based on experience that is no longer relevant."[118] Sometimes those misconceptions combined with needed caution make some people, according to Colonel Warden, "wary of drawing too many lessons from a single war or battle," although, as he points out, many lessons have come from specific moments or events such as the effect of the long bow at Agincourt, trench warfare around Richmond, the deadly effect of the machine gun in the Russo-Japanese war, the tank at Cambrai, and the aircraft sinking of the Ostfriesland. He went on to suggest that because of the rapid flow of technology and change, we do not "have the luxury of waiting for 10 replications of an event before we decide that real lessons exist."[119] To the Soviets, now Russians, it seems certain lessons are discernible about airpower and parallel war during Desert Storm. The head of the Soviet Air Force

reportedly said, "The war in the Persian Gulf provided a textbook example of what air supremacy means both for the country that gained it, and for the country ceding it."[120] Colonel David Glantz noted the Soviets had begun to identify important trends and that the most disconcerting was,

> . . . the possibility that new, technologically sophisticated weaponry may negate many of the more traditional measures of military power and have a revolutionary impact both on future combined-arms concepts and on future war itself.[121]

Although there are some strong possibilities associated with parallel war, there are some drawbacks as well. First, such a comprehensive assault seems to need sufficient force levels to make it feasible; the initial Instant Thunder plan was serial in nature until more forces became available. It also needs precise intelligence to maximize the precision bombing capabilities now inherent in airpower to keep the collateral civilian casualties and damage low. Of a bigger concern is the erroneous thinking that the simultaneous component of parallel war means doing everything at once. There is still a need for intense study to find and focus on the highest payoff targets for the effort expended. Forces must still be concentrated. World War II historian Matthew Cooper provides a story to support this point. During the invasion of Russia in World War II, Hitler's desire grew so that he wanted to do everything at once. He added a new requirement, the capture of the Caucasian oil fields, to the list of objectives to secure before the onset of winter. Halder and the Army leadership were shocked and tried to convince Hitler he was wrong but were unsuccessful. Hitler's vision exceeded his practical grasp. Instead of gaining time, "the most valuable of commodities," he'd squandered it.[122]

This point was also demonstrated to Major Ed Felker, USAF. He had just started the USA Command and General Staff College as a student when he was called to the Pentagon from 13-19 August 1990 to help refine

Instant Thunder. He wrote a monograph about his experiences and noted the doctrine implied that all air tasks and missions could be accomplished simultaneously. The technology seemed to be in place to make it possible but the doctrine actually hampered the process by parceling air out to everyone with a focus on *how* targets were hit and *how* many sorties were distributed rather than *what* was actually being accomplished. Air was being dispersed over a large area at different times rather than concentrating the assets at the decisive time and place. He concluded the biggest pay-back came when air was used by the theater commander to hit his most critical targets; anything less diluted the overall theater effort.[123]

Another large concern is the dependence of parallel war on technology. Airpower analyst Dennis Drew wrote, "The history of battle is, to a great extent, the story of military men struggling to cope with technology."[124] Desert Storm saw technology applied with stunning results. Stealth technology, for example, appeared to work remarkably well. Yet, Drew also observed ". . . in spite of the importance of technological innovation in the conduct of America's wars, superior technology has never been decisive. . . ." Why? He gave four reasons: Technological advantages are short lived; possession of advantages does not mean they will be effectively exploited; advantages can be negated by different weapons, defenses and superior strategy and tactics; and, finally, political considerations can limit full effectiveness.[125] A final caution about technology comes from Professor Hallion. He wrote, "Technology devoid of strategic thought and doctrinal underpinnings is incapable of serving a nation's defense needs."[126]

This vital strategic vision must guide not only technology but the entire effort towards the goal of influencing the will of the key decision

makers. Early airpower advocates saw airpower as the way to strike directly at the heart of the enemy. Massive bombings would motivate the population to turn on their leaders and demand peace. Parallel war seems to take a different view of "will." Warden's central goal of Instant Thunder was to disrupt Hussein's leadership structure and sever its ability to *exercise* its will. Warden looked at Iraq as a system upon which to impose strategic and operational paralysis at the right time (see chart-Appendix B). Such paralysis would take away enemy options while retaining coalition flexibility. The German observer said Desert Storm was the first C^3I war; Hussein was isolated and held at arms length until the coalition decided to eject the Iraqis from Kuwait.

If parallel war can isolate and interrupt the ability to exercise sovereign will then it might be possible to address one of the causes of war. Professor Geoffrey Blainey, in his book The Causes of War, wrote, "Wars usually begin when two nations disagree on their relative strength, and wars usually cease when the fighting nations agree on their relative strength."[127] Paralysis of one side which consequently puts it at the mercy of the other may clear up any doubts about relative strength and lead to quicker resolutions of conflicts.

Inducing this "paralysis" takes focused power on the right spots. Hitting the right spot brings up the topic of center(s) of gravity. Some argue that in Desert Storm there was really only one center of gravity, the enemy's main force.[128] This appears to contradict what Schwarzkopf believed; he described three for his CENTCOM staff. Dr. Robert Epstein, Professor of History at the School for Advanced Military Studies, commented that the air and surface forces had different approaches to the gulf war based upon differing interpretations of the term "center of gravity." The Air Force identified multiple centers of gravity within a

strategic context while the Army saw a single entity, the Republican Guard, as the true center of gravity. Of the two approaches, Dr. Epstein felt the Army's was particularly dangerous because of its singularity and narrowness of mind that disregarded other factors. Overall he felt the Air Force's view was comprehensive while the Army's was exclusive.[129]

This raises the issue of the viability of the independent air campaign concept which focuses on operational centers of gravity. Again, from Major Felker's experience, Instant Thunder

> focused on *what* needed to be done and the order in which it had to be done. The planners. . . put aside the normal fascination with *how* air power would be provided equally among all ground commanders, and identified real operational centers of gravity. [emphasis in original]. [130]

Addressing the legitimate concerns and needs of the ground forces is important. The main question is how airpower can best be used. Air Force doctrine stresses the importance of understanding the versatility of airpower -- it can attack "any facet of the enemy's power, at any level of warfare, at any time."[131] It goes on to state the following,

> While powerful synergies can be created when aerospace, land, and naval forces are employed in a single, integrated campaign, it is possible that aerospace forces can make the most effective contribution when they are employed in parallel or relatively independent aerospace campaigns. . . .[132]

The wording of that passage does not state an absolute, "it must always be this way," position. Rather, it acknowledges such an approach is situation specific. Is parallel war likely in the future? Perhaps.

If parallel war does occur in the future, it may help to make a better peace. Dennis Drew pointed out "all sides harbor bitter feelings because of widespread death and destruction. . . Winning a better state of peace after a modern war may be the most difficult of all tasks."[133] Campaign planners may find that parallel war with its lethality, precision, and potential to

impose strategic and operational paralysis causes fewer collateral casualties, less unnecessary destruction, and leaves fewer bitter feelings. Accurate simultaneous violence, to Professor Hallion, means better adherence to the human values the U.S. cherishes. For example, he cites the case where Bomber Command in World War II was happy to have 95 percent of its bombs falling within *three miles* of the aim point; In Desert Storm, almost 85 percent of the smart bombs hit within *10 feet* of their aim points [emphasis authors].[134] Which approach best reflects U.S. values? Future planners must carefully weigh their options. Parallel war may offer some significant advantages.

CONCLUSION

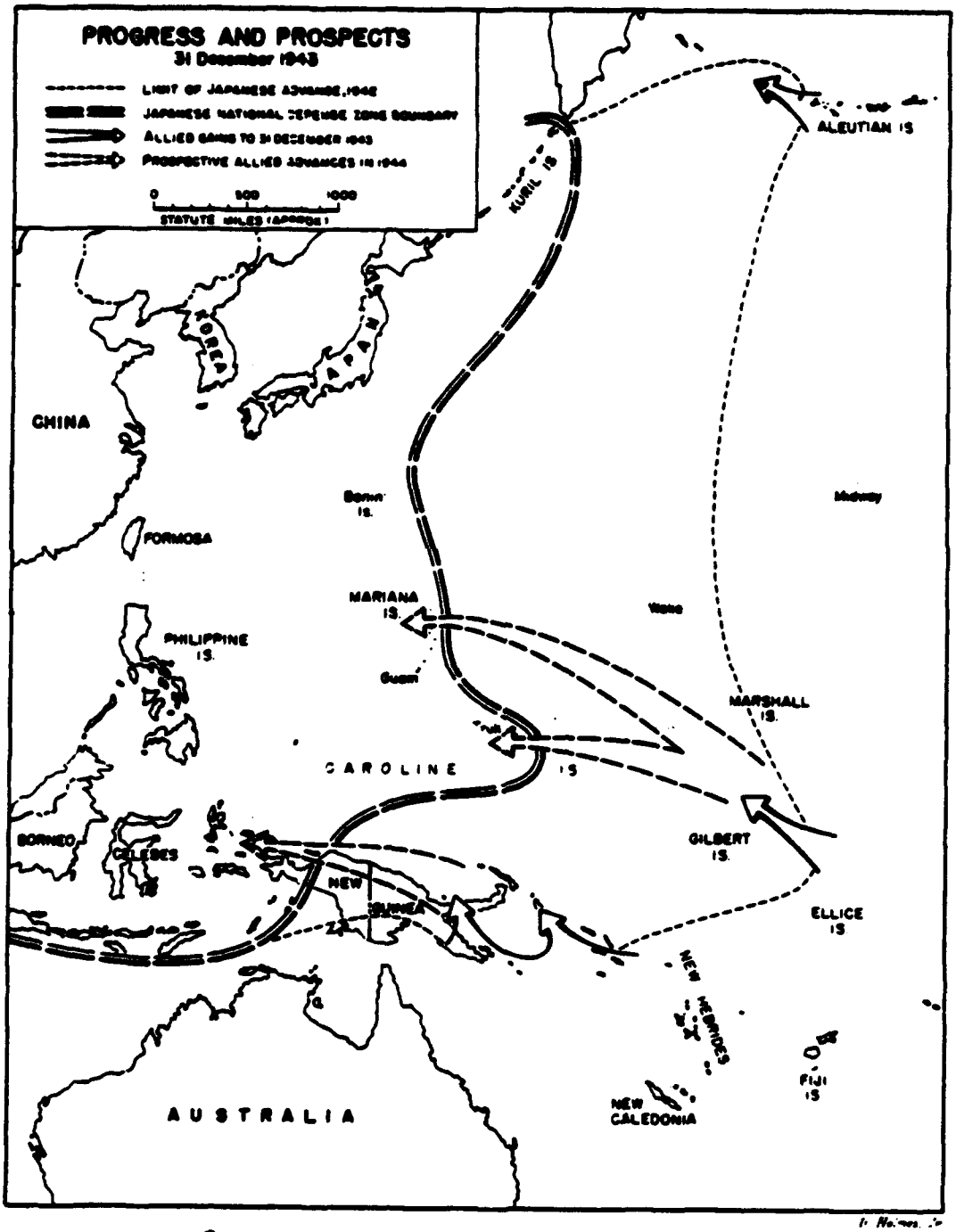
> In almost any art or profession a man can work with truths he has learned from musty books, but which have no life or meaning for him. . . It is never like that in war. Continual change and the need to respond to it compels the commander to carry the whole intellectual apparatus of his knowledge within him.
>
> Clausewitz[135]

This paper shows that the concept of American operational art has changed over time. In the SWPA during World War II the Japanese were defeated by MacArthur's serial war effort. MacArthur skillfully exploited the unique inherent capabilities of all the forces at his disposal to structure a campaign that took advantage of American strengths while taking advantage of Japanese weaknesses. It was a true joint, or as he called it, "triphibious" effort. Yet, historians who studied that campaign pointed out how much of a positive influence airpower had on shaping events. The ability to properly understand and visualize how to use airpower was the key operational consideration of the entire theater effort. It was not that way at first, but under Kenney's leadership airpower became MacArthur's key theater force.

Likewise, 50 years later, the theater air perspective paid off again although it was exhibited in a new form, that of parallel warfare. Instead of having to fight sequentially towards the key leadership, Schwarzkopf was able to directly attack the Iraqi decision makers and cripple their ability to effectively respond. Simultaneous and near continuous attack against selected critical strategic, operational, and tactical targets left the Iraqis paralyzed and at the mercy of the coalition forces. It was, as in World War II, a masterful joint effort. Saddam Hussein from the early days in August 1990, when he invaded Kuwait, faced the ever tightening vise of a naval blockade. Once combat operations began in January 1991, the naval vise was joined by the surgeon's scalpel and whirling buzzsaw of air and ground action. Again, just as in World War II, the theater commander's vision was shaped in large measure by the possibilities presented by airpower. The majority of the campaign, for political and military reasons, was borne by coalition airpower. While critical assignments were accomplished with distinction and vigor by all services it was the vision of what airpower could do in a parallel campaign that seemed instrumental to the swift victory.

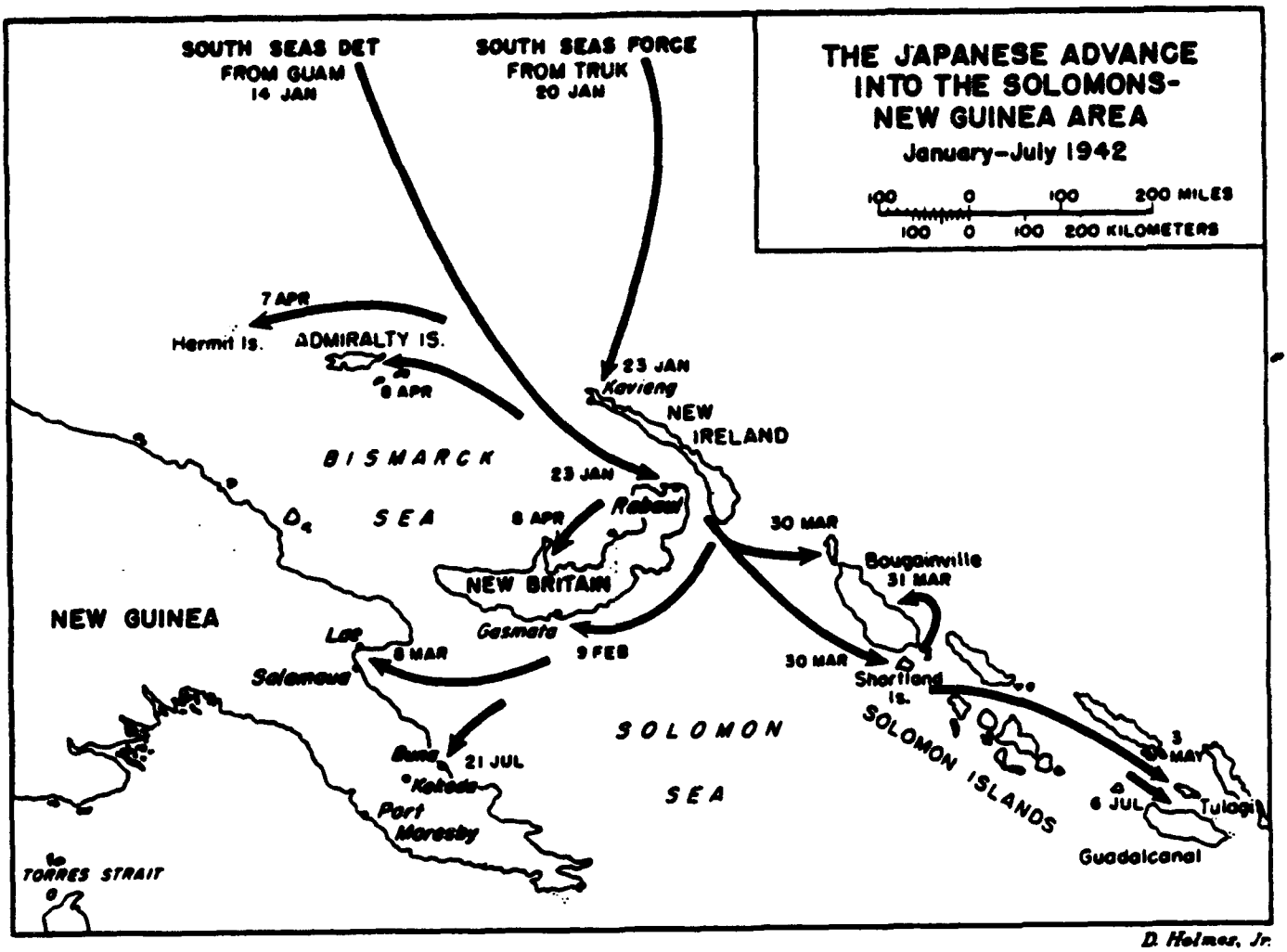
Airpower, especially the American manifestation of it, presents commanders and planners with ways and means to influence the course of events and the minds of key decision makers. The ability to perform parallel war may give America a way to quickly shatter an enemy's strategic and operational ability to resist. It will not always be applicable; every situation is unique. Yet, it is a tool and an approach that the American military must explore further and consider as it tries to achieve the American ideal of quick, decisive victory with minimum casualties.

Map A: General Situation SWPA early 1942



Source: Louis Morton, Strategy and Command, p.588.

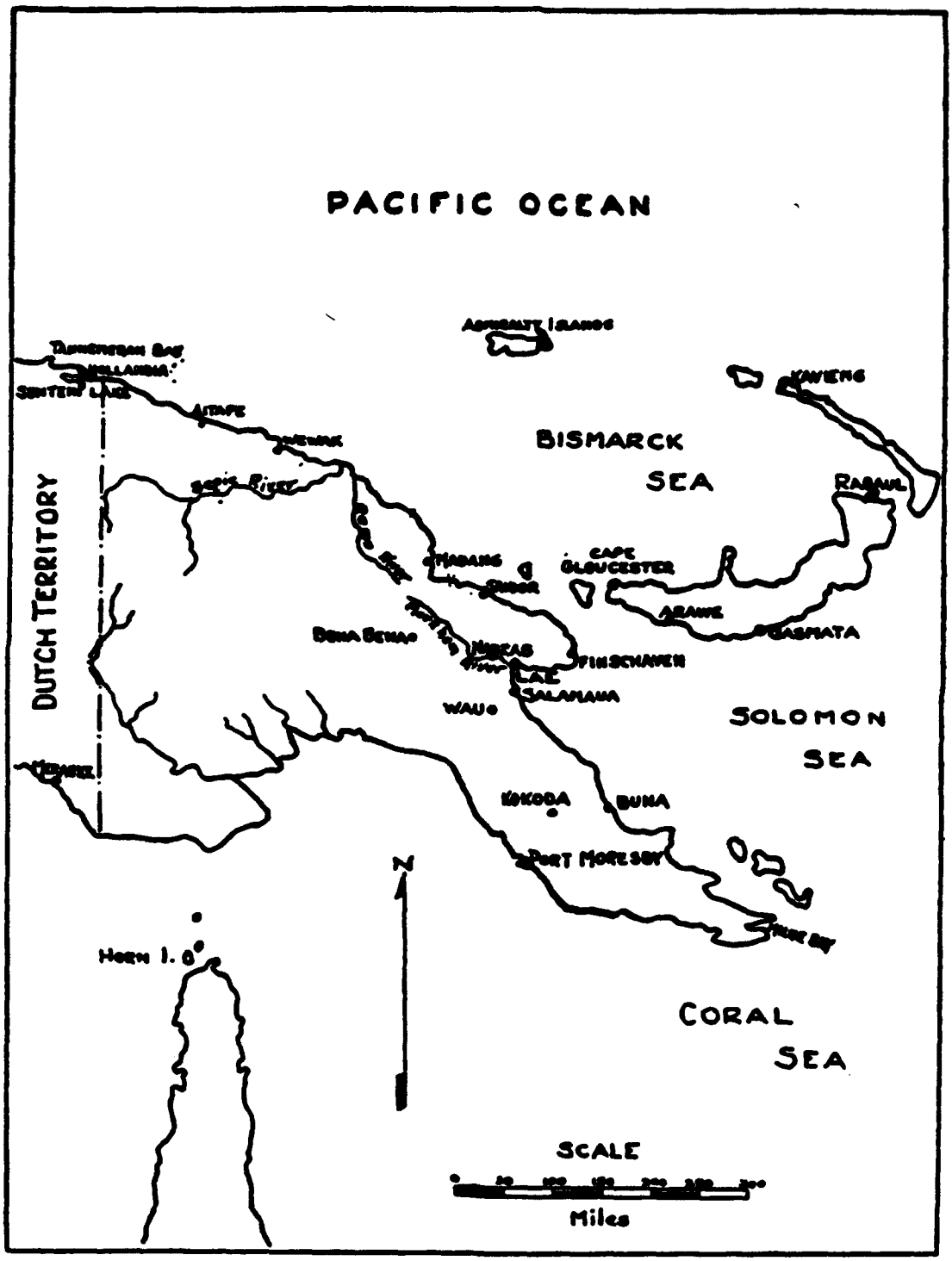
Map B: Japanese advance into New Guinea



MAP

Source: Louis Morton, Strategy and Command, p. 291.

Map C: South East New Guinea



Source: George C. Kenney, General Kenney Reports, p. 58.

Appendix A: Comparison of airpower capability

The elevation above the earth's surface may provide airpower relative advantages over surface forces which can be translated into certain attributes such as speed, range, flexibility, and versatility. This table highlights these attributes for each campaign but for simplicity's sake quantifies flexibility and versatility as mission/payload.

Buna - U.S. Airpower[136]

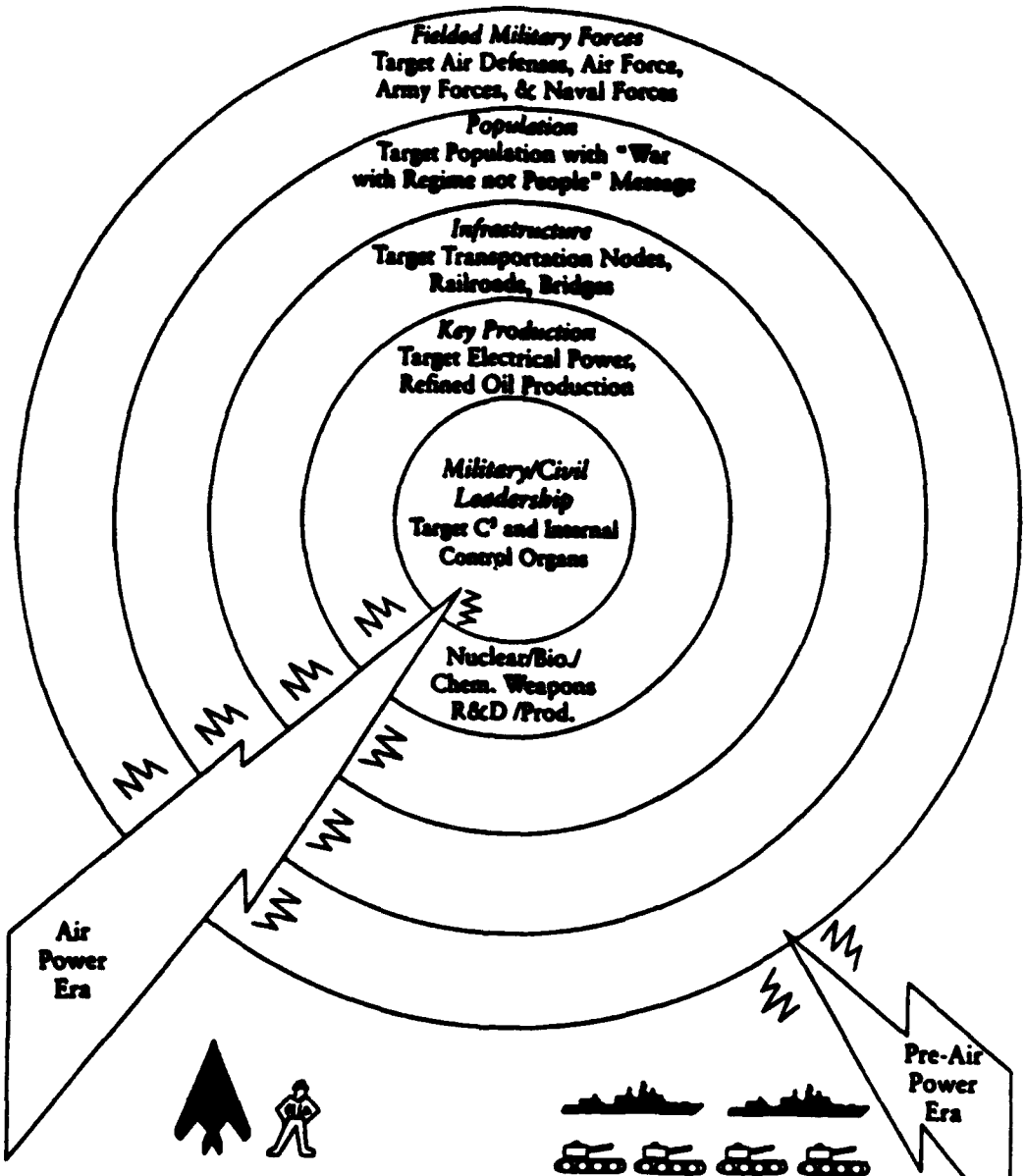
	Speed	Range	Msn/Payload
B-17	318 mph	2,000 miles	6,000 lbs bombs
P-38	420 mph	450 miles	4 x 50 Cal 2,000 lbs bombs
C-47	220 mph	1,500 miles	6,000 lbs cargo

Gulf War and U.S. Airpower[137]

	Speed	Range	Msn / Payload
F-111	1,655 mph	3,800 miles	27,000 lbs (1)
F-15	920 mph	2,500 miles	16,000 lbs (1)
A-10	520 mph	300 miles	16,000 lbs (1)
C-5	570 mph	6,500 miles	100,000 lbs cargo
KC-10 Tanker	610 mph	3,800 miles	170,000 lbs of fuel / cargo
TR-1	600 mph	3,800 miles	80,000' altitude
RPV Pioneer	148 mph	6 Hrs	450 lbs of various recon and intel sys
Cruise Missile	500 mph	1,500 miles	Accuracy = 65 feet
AH-64	230 mph	375 miles	Guns and missiles
AWACS	625 mph	4,300 miles	Radar detection of tgts beyond 230 miles

Note 1. Combination of ordnance: bombs, missiles, or bullets.

Appendix B: Warden's Strategic Rings



Small Forces Required
High Military Leverage
Precise and Focused
Low "Misery Factor"
- Low Friendly Losses
- Low Collateral Losses

Immediate Global Response
"Inside-Out" Warfare
- Simultaneous
- Parallel

Post-Clausewitzian/Mahanistic

Large Forces Required
Low Military Leverage
Imprecise and General
High "Misery Factor"
- High Friendly Losses
- High Collateral Losses

Slow Response
Traditional Sequential Warfare
Clausewitzian/Mahanistic

Source: Richard Hallion, Storm over Iraq, p. 152.

ENDNOTES

[1] Joint Pub 1. Joint Warfare of the US Armed Forces. (Washington, DC: National Defense University Press, 11 Nov 1991), iii. Emphasis in the original.

[2] Besides Joint Pub 1 see also Air Force Manual 1-1, Basic Aerospace Doctrine of the United States Air Force. (Washington, DC: Department of the Air Force, March 1992), and FM 100-5, Operations (Final Draft). (Washington, DC: Department of the Army, 19 Jan 1993). The Army is widely credited with initiating the renewed interest in the operational level of war.

[3] The best, most comprehensive discussion of operational art found in the literature search was James M. Dubik's "A Guide To The Study Of Operational Art And Campaign Design." (Draft unpublished paper, School of Advanced Military Studies. Ft. Leavenworth, KS: Command and General Staff College, 30 May 1991). On pages 5-8, Dubik wrote:

> Operational art concerns setting the conditions for multiple engagements, major operations, or battles to be conducted in sequence or simultaneously each of which is--individually and as an aggregate--contributory to achieving the commander's overall goal which is attaining the strategic aims. In campaigns manifesting operational art, tactical successes are directly linked to strategic success. . . tactical successes, while important, are not necessarily linked to strategic success--one must be careful to properly orchestrate events to ensure the linkages between tactical, operational and strategic levels are established to get the most efficient and effective use of the available forces at the least cost.

[4] For an in-depth discussion of the maturation of American airpower see, Dennis M. Drew's "Desert Storm as a Symbol," Airpower Journal, Fall 1992, 4-13.

[5] For the most recent articulation of this "ideal" see FM 100-5, 1-4. The new field manual recognizes, and stresses, the expectations of the American people and the use of *their* military.

[6] See Charles H. Jacoby, "In Search of Quick Decision: The Myth of the Independent Air Campaign." (Monograph, School of Advanced Military Studies. Ft. Leavenworth, KS: Command and General Staff College, 1991), 2. For a broader perspective, see the following: Greg Wilcox, "The Changing Equation," Military Review, Oct 1992, 80; Harry Summers, "Civilian versus military targets," Air Force Times, 8 Jul 1991, 62; compare all with Alan L. Gropman. "Air power's effectiveness in gulf not in question," Air Force Times, 29 Jul 1991, 23. For specific Air Force insights see Charles D. Link's article "The Role of the US Air Force in the Employment of Air Power," in The Future of Air Power, edited by Richard H. Schultz, Jr. (et al). (Maxwell AFB, AL: Air University Press, July 1992), 83-87.

[7] Jacoby, 2.

[8] Carl von Clausewitz, On War. Edited and Translated by Michael Howard and Peter Paret. (Princeton, NJ: Princeton University Press, 1976), 185. Clausewitz said "...the seeds of wisdom that are to bear fruit in the intellect are sown less by critical studies and learned monographs than by insights, broad impressions, and flashes of intuition."

[9] Joint Pub 1, 32.

[10] Irving B. Holley, Jr. in Emerging Doctrines and Technologies, edited by Robert L. Pfaltzfraff (et al). (Lexington, MA: D.C. Heath and Company, 1988), 14.

[11] Karl Albrecht, Brain Power. (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1980), 34.

[12] See John D. Waghelstein's "Some Thoughts on Operation Desert Storm and Future Wars," Military Review, Feb 92, 80-83 and contrast it to John Warden's "Employing Air Power in the Twenty-first Century" in The Future of Air Power, edited by Richard H. Schultz (et al). (Maxwell AFB, AL: Air University Press, 1991), 57-83.

[13] For a discussion of these dangers see Steven R. Mann, "Chaos Theory and Strategic Thought," Parameters, Autumn 1992, 54-68.

[14] von Clausewitz, 132.

[15] Richard P. Hallion, Storm over Iraq. (Washington, DC: Smithsonian Institution Press, 1992), 4.

[16] Bradley C. Hosmer, "American Air Power and Grand Tactics," Airpower Journal, Summer 1987, 10-12.

[17] Air Force Manual 1-1, Vol 1, 8.

[18] von Clausewitz, 75.

[19] Ibid., 77.

[20] Ibid., 90.

[21] Dennis M. Drew and Donald M. Snow, The Eagles's Talons: The American experience at war. (Maxwell AFB, AL: Air University Press, 1988), 17.

[22] Air Force Manual 1-1, Vol 1, 8, 10.

[23] FM 100-5, 3-13.

[24] US Army, FM 100-15, Corps Operations. (Washington, DC: Department of the Army, 13 Sep 1989), 3-0. The author was made aware of this point through Edward J. Felker's "Does the Air Force Practice Its Doctrine? A Limited and Focused Air Campaign Concept." (Master of Military Art and Science thesis. Ft. Leavenworth, KS: Command and General Staff College, 1991). This emphasis on the close battle may change in the future when FM 100-15 is rewritten to reflect the more balanced view of the battlefield inherent in the draft FM 100-5. It nevertheless is reasonably accurate to assert the Army has had, and will probably retain, a battlefield focus.

[25] For a fuller explanation from air and surface experts of the sources and impacts of these varying world views see Dennis M. Drew's "Joint Operations: The World Looks Different From 10,000 Feet," Airpower Journal, Fall 1988, 4-16, and L.D. Holder's "Educating and Training for Theater Warfare," Military Review, Sep 1990, 85-99.

[26] von Clausewitz, 79.

[27] Ibid., 209.

[28] Ibid., 77.

[29] Public Law 102-25. Conduct of the Persian Gulf War--Final Report to Congress. (Washington, DC: Department of Defense, April 1992), 238.

[30] Air Force Manual 1-1, Vol 2, 210.

[31] The literature is replete with references to this. General Hosmer, quoted earlier in this paper, specifically mentions this campaign; it is also a prominent feature in John Warden's oft quoted book on airpower at the operational level The Air Campaign (Washington, DC: National Defense University Press, 1988). Finally, AFM 1-1, especially Vol 2, makes numerous references to MacArthur and his air chief Kenney's exploits in WW II.

[32] Reports of General MacArthur - Japanese Operations in the Southwest Pacific Area. (Washington, DC: U.S. Government Printing Office, 1966), 44.

[33] Ibid.

[34] Robert Ross Smith, The Approach to the Philippines. (Washington, DC: Center of Military History, US Army, 1953), 3.

[35] Louis Morton, Strategy and Command: The first two years. (Washington, DC: Office of the Chief of Military History, 1962), 451.

[36] Douglas MacArthur, Reminiscences. (New York: McGraw Hill Book Company, 1964), 156.

[37] Ibid.

[38] Morton, 330.

[39] Ibid., 189.

[40] Reports of General MacArthur - Japanese Operations in the Southwest Pacific Area, 127.

[41] Ibid.

[42] Ibid.

[43] MacArthur, 166.

[44] George C. Kenney, General Kenney Reports. (New York: Duell, Sloan and Pearce, 1949), 44-45.

[45] Charles E. Heller and William A. Stoff (editors), America's First Battles. (Lawrence, KS: University Press of Kansas, 1986), 391. See footnote # 79 which references criticism by Lt. Gen. Eichelberger, the US ground force commander, from his book Jungle Road, 40, about fratricide and close air support.

[46] Samuel Milner, Victory in Papua. (Washington, DC: Office of the Chief of Military History, United States Army, 1957), 374-376. Excellent section describing the plusses and minuses of airpower in the campaign.

[47] Robert L. Eichelberger, History of the Buna Campaign. Official report dated 1943 with unknown publisher and publication city, 81-82.

[48] Reports of General MacArthur - Japanese Operations in the Southwest Pacific Area, footnote 92 on pg 198.

[49] Eichelberger, 59-62.

[50] D. Clayton James, The years of MacArthur, Vol II, 1941-1945. (Boston, MA: Houghton Mifflin Company, 1975), 229-231.

[51] Kenney, , 144-146. Describes the story of the testing and the reluctance of the staff to rely upon such a seemingly unreliable method of delivery.

[52] James, 199.

[53] Kenney, 124.

[54] James, 279-280. 60,000 troops fought on Guadalcanal and there were 5845 casualties of which 1600 were KIA; 1 out of every 37 combatants lost their lives. At Buna, 33,000 fought and there were 8546 casualties and 3095 KIA; 1 out of every 11 lost their lives.

[55] Reports of General MacArthur - Japanese Operations in the Southwest Pacific Area., 202-204.

[56] MacArthur, 171.

[57] Ronald H. Spector, Eagle Against the Sun. (New York: Vintage Books, 1985), 228.

[58] Reports of General MacArthur - Japanese Operations in the Southwest Pacific Area, 197.

[59] Smith, 86.

[60] Kenney, 251.

[61] The entire preceding story as well as the quote comes from James, 324-325.

[62] Reports of General MacArthur - Japanese Operations in the Southwest Pacific Area, 215. See also Col. Obata's comments for the senior officers perspectives. He was a staff officer with the 18th Japanese Army and said,

> Henceforth the Japanese army air force was obliged to adopt a negative strategy and defensive tactics involving a general retreat to rear-line airfields. Air support of ground operations was severely curtailed, and the schedule of surface transport movement was completely thrown off owing to the impossibility of providing air escort for convoys.

[63] James, 327.

[64] Ibid., 335.

[65] This paragraph is a paraphrase of the staff comments from Reports of General MacArthur - Japanese Operations in the Southwest Pacific Area, 244-248.

[66] Ibid., 263-266.

[67] Ibid., 272.

[68] Smith, 347. He said,

> Having suffered heavy losses of ground troops, aircraft, and pilots, the Japanese Army was unable to assume its share of preparations for the counter offensive. Moreover, continuous shipping losses and Allied air attacks against the prospective bases made it impossible for the Japanese to send enough army troops forward even to defend those bases

properly, let alone develop them to support major counter attacks.

[69] James J. Schneider, "Theoretical Implications of Operational Art," Military Review, Sep 1990, 17-27.

[70] Kenney's' recollections as quoted in James, 198.

[71] See both MacArthur, 157-158; and James, 198-199 for compilation of Kenney's initial exploits.

[72] James, 200-201.

[73] Ibid., 246-247.

[74] Ibid., 281.

[75] Richard P. Hallion, Storm over Iraq. (Washington, DC: Smithsonian Institution Press, 1992), 162.

[76] See Warden, The Air Campaign. The paragraph comments reflect author's view of Warden's main points.

[77] Michael S. Palmer, "The Storm in the Air: One Plan, Two Air Wars?," Air Power History, Winter 1992, 24-26.

[78] Ibid., 30.

[79] H. Norman Schwarzkopf with Peter Petre, It Doesn't Take a Hero. (New York: Bantam Books, 1992), 318.

[80] From briefing by John A. Warden to the School of Advanced Military Studies on 16 Dec 1992, and follow up interview with author on the same day. See also Public Law 102-25, Conduct of the Persian Gulf War--Final Report to Congress. (Washington, DC: Department of Defense, April 1992), 92.

[81] Schwarzkopf, 318-319.

[82] Ibid., 320-321.

[83] From briefing by John A. Warden to the School of Advanced Military Studies on 16 Dec 1992, and follow up interview with author on the same day.

[84] ER Hooton, and Kenneth Munson (editors), Jane's Battlefield Surveillance Systems 1991-1992. (Alexandria, VA: Jane's Information Group, 1991), 133.

[85] Schwarzkopf, 320. See also Public Law 102-25, 92-93.

[86] Palmer, 27-28.

[87] Ibid.

[88] Public Law 102-25, 72, 93, 95.

[89] Ibid., 95.

[90] Ibid., 75, 95.

[91] Ibid., 74, 75, 95.

[92] Hallion, 169.

[93] Ibid.

[94] Public Law 102-25, 177.

[95] This narrative comes from many sources. See Schwarzkopf, 414-415; also Hallion, 162-176. Finally, consult Public Law 102-25, 116-120.

[96] See Public Law 102-25, 116-120. Also, Hallion, 162-175.

[97] James Blackwell, Thunder in the Desert. (New York: Bantam Books, 191), 144.

[98] ER Hooton, and Kenneth Munson (editors), Jane's Battlefield Surveillance Systems 1991-1992. (Alexandria, VA: Jane's Information Group, 1991), 163-166.

[99] James P. Coyne, Airpower in the Gulf. (Arlington, VA; Air force Association, 1992), 135-136.

[100] Ibid., 128.

[101] Schwarzkopf, 420-421, 439.

[102] Charles A. Horner, "The Air Campaign." Military Review, Sep 1991, 24.

[103] Hallion, 266-267. Hallion wrote,

> If Washington, D.C., were subjected to the very same attacks that hit Iraq in the first 24 hours of the air campaign, the equivalent damage would have been the destruction of the White House; the Pentagon; the Capitol; the Blair House (part of the White House complex); the Executive Office Building; FBI Headquarters; CIA Headquarters; Defense Intelligence Agency Headquarters; National Security Agency Headquarters; Bolling and Andrews air force bases; the Navy Yard and Navy Annex; the Naval Air Test Center at Patuxent

River, Maryland; the Federal Communications Center; [F]orts Belvoir, McNair, Myer, and Meade; Camp David; Quantico Marine Corps base; Suitland Federal Center; Sprint, MCI, and AT&T regional centers; and all significant power plants and fuel storage facilities.

[104] From briefing by John A. Warden to the School of Advanced Military Studies on 16 Dec 1992, and follow up interview with author on the same day.

[105] Brian Collins, "Soviet View of the Storm," Air Force Magazine, Jul 1992, 70, 74.

[106] Lieutenant General Gorbachev as quoted in Gilberto Villahermosa, Desert Storm: The Soviet View. (Ft. Leavenworth, KS: Foreign Military Studies Office, May 1991), 3, 8.

[107] Ibid., 29.

[108] Briefing on 24 Feb 1993 by LTC Zehrer, Instructor at Fuhrnesakademie der Bundeswher, on historical roots of operational art to School of Advanced Military Studies, Ft. Leavenworth, KS.

[109] Public Law 102-25, xx, xxi.

[110] Roland Dannreuther, The Gulf Conflict: A Political and Strategic Analysis. (London: Brassey's, 1992), 50-51, 55.

[111] Douglas W. Craft, An Operational Analysis of the Persian Gulf War. (Carlisle Barracks, PA: Strategic Studies Institute, 31 Aug 1992), 37.

[112] See both Public Law 102-25, 248-249; and, Hallion, Storm over Iraq, 206-209. This comment is not meant to belittle the ground commander's concerns. Rather, it reemphasizes the theater commander's role as the setter of priorities. The relatively low number of ground casualties (as compared to the estimates ranging in the thousands) perhaps attests to the judgment of General Schwarzkopf and his air advisors.

[113] Norman Friedman, Desert Victory. (Annapolis, MD: Naval Institute Press, 1991), 170. Friedman wrote,

> The navy's operational experience, in places like Libya in 1986, was concentrated in the penetration of an enemy's national air defense system. What happened afterward tended to be quite limited, intended to demonstrate that worse could follow. Targets were chosen for their political impact. Naval officers . . . probably thought mainly in terms of close air support of the soldiers and marines . . . .

[114] Ibid., 172-173.

[115] Hallion, 257-258. For a more in-depth opinion of the naval contribution, and its overall understanding of operational art, see 254-259, and 118-119 in the same reference.

[116] von Clausewitz, 120.

[117] Gary P. Cox, "Of Aphorisms, Lessons, and Paradigms," The Journal of Military History, July 1992, 389-401. This thought was also used in the author's recent monograph, "American Airpower: The Emergence of a Dominant Tactical Advantage," Monograph, School of Advanced Military Studies. Ft. Leavenworth, KS: Command and General Staff College, 1992, 35.

[118] Larry D. Welch in Richard H. Schultz, Jr. and Robert L. Pfaltzgraff, Jr. (editors), The Future of Air Power. (Maxwell AFB, AL: Air University Press, July 1992), 161.

[119] John A. Warden in Richard H. Schultz, Jr. and Robert L. Pfaltzgraff, Jr. (editors), The Future of Air Power. (Maxwell AFB, AL: Air University Press, July 1992), 80.

[120] General A. Malyukov as quoted in Public Law 102-25, 161.

[121] See Col. David M. Glantz comments in introduction to Gilberto Villahermosa, Desert Storm: The Soviet View.

[122] Matthew Cooper, The German Army 1933-1945. (Chelsea, MI: Scarborough House (Paperback edition), 1990), 316-317, 340.

[123] Felker, 123,126.

[124] Drew, The Eagle's Talons: The American experience at War, 28.

[125] Ibid., 394-395.

[126] Richard P. Hallion, Strike from the Sky. (Washington, DC: Smithsonian Institution Press, 1989), 270.

[127] Geoffrey Blainey, The Causes of War. (New York: The Free Press, 1988),293.

[128] Stephen T. Jordan Jr., "Operational Art: Practical Utility or Defunct Doctrinal Concept." Monograph, School of Advanced Military Studies. Ft. Leavenworth, KS: Command and General Staff College, 1991, 36.

[129] Robert M. Epstein, "Course Commentary on the Historical Practice of Operational Art." School of Advanced Military Studies. Ft. Leavenworth, KS: Command and General Staff College, Academic year 1992/1993, 4-36-1.

[130] Felker, 124-125.

[131] Air Force Manual 1-1, Vol 1, 8-9.

[132] Ibid., 9.

[133] Drew, The Eagles's Talons: The American experience at War, 34.

[134] Hallion, Storm over Iraq, 264.

[135] von Clausewitz, 147.

[136] Andrew W. Waters, All the U.S. Air Force Airplanes. (New York: Hippocrene, 1983), 90-91, 133-135, and 254-256.

[137] Data on F-111, A-10, C-5, KC-10, TR-1, F-15, and AWACS comes from Waters pgs 192, 164, 167, 302, 196-7, and 170 respectively. For RPV info see Kenneth Munson, World Unmanned Aircraft. (London: Jane's Publishing Co., 1988), 189-190. For AH-64 specifics see Elfan Rees, World Military Helicopters. (London: Jane's Publishing Co., 1986), 101. For cruise missile info see Christopher Chant, World Encyclopedia of Modern Air Weapons. (Wellingborough, England: Patrick Stephens Limited, 1988), 190.

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